

SO-CALLED CHAUFFEUR'S FRACTURE*

By PHILIP STEPHENS, Los Angeles

It might seem to the casual observer, in this day of mechanical advancement and perfection of the automobile, that the so-called "chauffeur's fracture" would be scarce, or almost absent from the list of our fracture cases.

Recently, in getting together a collection of wrist fracture cases for a symposium held by our Industrial Section, I was struck by the many, or, I might say, the majority of my cases which had as their causation the cranking or backfiring of an automobile. A great many of these cases were typical Colles's fractures, or what I believe to be described in most textbooks as "classical" Colles's fractures, but which are not the radial fracture described by Colles of Dublin. We find the same types of wrist fracture produced by automobile cranking that we have always had and still have from falls upon the outstretched hand.

In spite of the advent and general use of self-starters, their use is mostly limited to passenger or pleasure cars, while the heavy trucks and light delivery cars must still be cranked. They are capable of producing many injuries other than wrist fractures, ranging from these to many varied and unlooked-for conditions, due either to direct violence or the handle of the crank being wrenched violently from the hand.

These, however, will not be discussed, but only the bony injuries to the wrist—usually radial head, and termed chauffeur's fracture. I am free to admit the term is neither correct nor scientific, and is used only to designate the cause of many types of fracture, anatomically and mechanically, which occur as the result of this most potent and usually direct force delivered to the wrist. To me, it is remarkable how many varieties occur, but this is easily accounted for, considering the mechanical factor of the production.

Backfiring, or the explosive force which tends to suddenly change the direction of the automobile crank or handle, when being carried around in a circle, may happen at approximately four points in the circle in which the handle is being carried. This being the case, the hand grasping it may be in a neutral position, it may be flexed on the wrist, or dorso flexed. These may also be altered by the position assumed by the operator standing in front of the car, certain postures tending to bring the arm in supination, or the reverse, pronation, all of which receive the force transmitted in a different line, and produce different anatomical results, varying as widely as the many positions assumed.

It is plain to be seen, then, that the mechanical factors in the production of these injuries are practically the same as those which have always been described in our textbooks as the cause of most of our wrist breaks, and this long before the advent of the automobile, viz., a fall with the hand outstretched, catching oneself on the dorso flexed hand, and modified less commonly by lighting on

the flexed hand, with arm thrown to the side of the body in position of supination, or more toward the front in falling forward with the arm in pronation.

Time will not permit a review of the many types of wrist fracture produced by mechanical force. However, a few of the common forms will be discussed, with their treatment and progress, from the industrial standpoint.

I think I am correct in saying that the great majority of skeletal injuries of the wrist due to automobile starting are rather minor in character, if properly recognized and properly treated; that the majority are small fissures, with no deformity or defect in alignment or position. The commonest of these, perhaps, is the fracture of the radial styloid process, simple in its aspect when the small fragment is not displaced, but important when we consider the fact that our fracture line runs into and impairs an articular surface in its apposition and articulation with the metacarpals.

Then there is the minor fracture, transverse usually, in young subjects, following the epiphyseal line, and which might be properly called epiphyseal separation.

More nearly simulating this is the so-called cortical fracture, in which the cortex is fractured, there being no disturbance of the periosteum, which, unless the radiograms are unusually good, will not show until there is a liberal amount of callus thrown out, and this in early pictures is very likely to be overlooked. These facts, I believe, are of great importance from an industrial standpoint, and in my experience I have had several cases in which I had made a diagnosis of a simple sprain, and in which the pain, swelling and loss of function persisted. Later pictures showed plainly a distinct line of callus, proving an actual fracture had existed.

Perhaps the most important lesion is the so-called typical or classical Colles of the wrist, being a fracture within the last inch of articulation—may be transverse or oblique, the lower fragment being displaced backward so that the articular surface looks downward and backward. This fracture may be complicated by a fracture of the styloid of the ulna, or even of the scaphoid. The latter particularly should never be overlooked. This type of deformity produces the typical silver fork, spade or bayonet deformity so readily recognized. To me, the worst form of this peculiar variety is where the line of fracture is extremely oblique and by reason of this extreme obliquity the correct position is very difficult to properly maintain. We may have practically the same line of fracture, but with displacement downward and forward, sometimes called reverse Colles, but really described and properly named by Dr. Smith.

These forms are also complicated with comminution, or added lines of fracture running into the articular surface of the head, making T or H fractures.

But perhaps the most important of all from the standpoint of treatment, loss of time in industry and bad functional results, is the impacted variety

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in older subjects. These very often, in spite of our best efforts, result in impaired flexion, pronation and supination, by reason of the usual shortening of the forearm on the radial side. Instead of having a "half moon" concave joint surface with which to articulate, with the composite-convex surface of the metacarpals, we have a flat-square surface which does not fit, and deformity, pain and disturbed function result.

As to deformity, I have spoken of the silver fork type, which is so unmistakable that we may all recognize it at sight; but I believe the most common and least spoken of is where the entire hand has the appearance of being shifted toward the radial side, with an undue prominence of the ulnar styloid and with a typical fullness and obliteration of the wrinkles over the front of the wrist. Crepitus is rare, and in these days of Roentgen ray we should not attempt to elicit. Pictures should be carefully taken in both planes, and in obscure cases both wrists should be rayed for comparison.

Pain is rather characteristic in one point only that I have any knowledge of, viz., is markedly increased by any manipulation of the thumb.

Treatment—As a great majority of fractures of the lower end of the forearm are simple and without displacement, the treatment is comparatively simple. Any simple single splint may be applied to the palmar surface, reaching from elbow to middle of palm, padded to conform to the normal arch of the forearm. It should be held in place by adhesive straps at wrist and below elbow, and firmly bandaged over all.

The "classical" fracture, however, is more difficult to manage, and here we find that the anatomy and mechanical force used in the causation of the fracture must be well borne in mind in order to properly reduce and maintain this correction comfortably and gain best results with perfectly useful, functioning wrists.

I believe that more failures and deformities are the direct result of improper or insufficient attempts at reduction than any other factor. Practically all of these fractures are easily diagnosed, even before we get our picture, and the vast majority of patients need a short anesthetic, either gas or ether, in order for the surgeon to use the best methods and manipulation to correct the deformity. Thus, the task is fairly easy, when it is kept in mind that the deformity must be increased before the short fragment is set in place. To this end, with traction and the hand, and the thumbs firmly over the dorsal surface of the radial head, the patient's hand is firmly forced back and out, then down and in, which usually drives the short fragment downward into place, and the original deformity is then brought, roughly speaking, upward and outward. The surgeon should correct, or over-correct, by maintaining a position with some retention, the position tending downward and inward, viz., flexion and inclination downward and toward the ulnar side. There are many ready-made splints manufactured and sold with this conformation in mind, and very often in emergency can be carried and used to advantage—the Walker, of papier mache, molded and perforated aluminum,

etc., etc. However, the molded plaster, I believe, is ideal, especially in those cases where the obliquity of the fracture line is great and there is a tendency for the short fragment to displace backward.

In order to maintain position between reduction and application of splints, a roller bandage may be lightly grasped by the patient, or, if assistance is not obtainable, the arm may be placed on the patient's thigh, the hand pulled firmly over the three-quarter flexed knee, and the posterior one-half of the splint be molded on in this position.

A circular plaster cast should not be used, or, if used, with extreme care, or cut along both outer and inner borders, even before perfect solidity of the cast is obtained, in order to provide for swelling and frequent after-inspection.

Anterior and posterior splints of board are good and easily applied, preferably with a tendency toward pistol shape or slight angulation toward the ulnar side, and proper padding of the palmar half under the wrist is made to conform to the radial arch. The wrist should be inspected often, and at each inspection, if possible, the apparatus removed and the arm gently bathed with alcohol.

Early passive motion and massage are extremely important, especially for the aged, or even those beyond adult age, as I believe the prolific source of bad results, next to improper reduction, is prolonged splinting, without proper passive movement and massage.

In a great many cases of the impacted variety, complicated with comminution of the head, fractures and ulnar styloid, especially in aged patients, radial shortening will result, together with tenosynovitis, prolonged convalescence, and eventually some permanent disability. In this event, the surgeon must begin early, with all energy, to apply means at hand to lessen this deformity and loss of proper function, with early massage, manipulation, hydrotherapy, etc.

Three weeks is a fair average for the wearing of splints. No support, wrist band, or adhesive strapping is especially needed unless for the psychic effect on the patient, and this phase of treatment of the average industrial case is one that must be carefully considered.

Operative interference for old deformities, bad results, poor functioning, shortening of radius with resultant defects, are resorted to, but with, I am free to say, not very brilliant results in my own experience, and is perhaps an additional incentive to increased effort in treating them properly in the beginning.

The Thomas wrench is often useful, if followed by careful massage and hydrotherapy, in maintaining the motion gained by the force used to correct deformity.

In pronounced impacted cases, with shortened radial side, a resection of a short portion of the ulna often restores the proper relation of the two bones forming the articular surface, and thereby improves flexion and the related movements of the wrist.

An osteotomy of the head of the radius is often of great use in cases of deformity where there appears to be a lateral shifting of the entire hand.

toward the radial side, with an accompanying prominence of the ulnar head.

Operative interference, with removal of one or more fragments, is usually necessary in cases of fracture of the scaphoid or semi-lunar, before improved or perfect function is obtained.

I believe the average conscientious surgeon of long experience in the treatment of wrist fractures, when reviewing and summarizing his cases carefully, sees some results which cannot add to his ego, and he will feel more keenly the responsi-

bility of caring for a case in hand. However, he will probably have arrived at a sound and sane conclusion which has caused him to fairly well standardize his procedure, as follows: Complete reduction immediately after the injury, the appreciation of the factors of treatment and after-treatment, very early motion, and short time of immobilization. When these principles are carefully and conscientiously carried out he may feel that the majority of his wrist fracture cases will result satisfactorily.

REMOVAL OF PUS TUBES AND SAVING OF THE OVARIES, AND SUSPENSION OF THE UTERUS.

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The essential features claimed for this operation are as follows:

(a) Removal of the pus tubes, including a small portion of the uterus at their point of attachment.

(b) Protection and preservation of the ovaries by means of covering them with broad ligament.

(c) Fixation of the uterus in a proper position by means of fastening the round ligament to the abdominal wall.

The technique of the operation may be best described by reference to the figures.

Kocher forceps are now thrust through the apo-

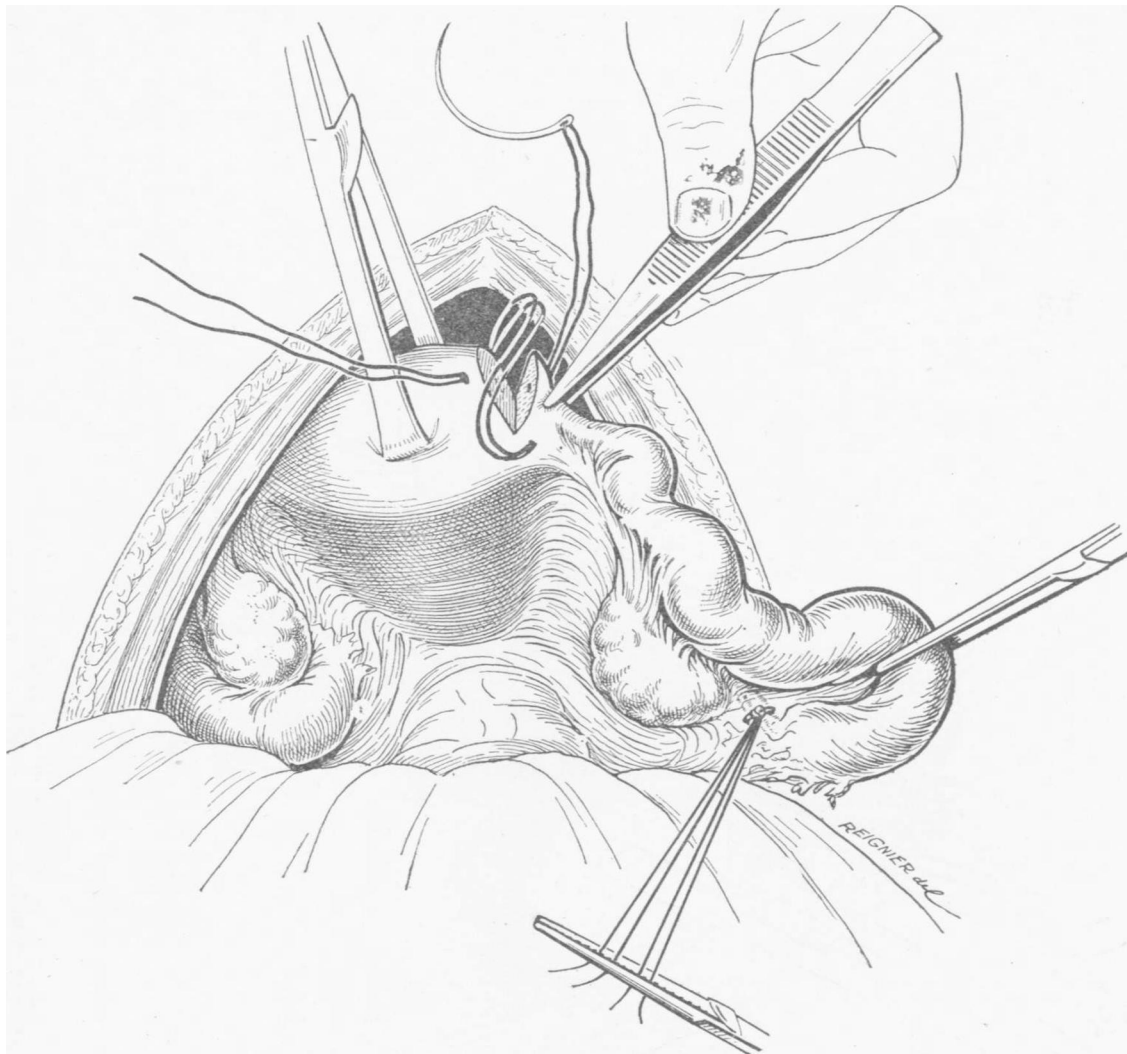


Fig. 1

Fig. 1—The ovarian artery has been ligated and the removal of the tube begun. Note that a V-shaped piece of the uterus has been excised at the tubal attachment.

This eliminates the occurrence of the post-operative pain so often observed and due to the small stump of the tube allowed to remain.